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10/088,659	03/20/2002	Tatsuo Akimoto	1069-02	2778

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EXAMINER

MENON, KRISHNAN S

ART UNIT PAPER NUMBER

1723

DATE MAILED: 05/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/088,659

Applicant(s)

AKIMOTO ET AL.

Examiner

Krishnan S Menon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 23-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3,5</u> | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Election/Restrictions

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-22, drawn to hollow fiber module.

Group II, claim(s) 23-27, drawn to method of making hollow fiber module.

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the process as claimed can be used to make other materially different products like tubular membrane modules and heat exchangers.

Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. Daniel Christenbury on 5/2/03 a provisional election was made without traverse to prosecute the invention of group I, claims 1-22. Affirmation of this election must be made by applicant in replying to this Office action. Claims 23-27 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 6 and 17 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by JP 09-187628.

JP 628 teaches a hollow fiber module comprising a cylindrical case (4-fig 1), a first sealing body (7), a second sealing body (6), a first cap outside the first sealing body (3), a second cap outside the second sealing body (2), filtration chamber inside the case, first chamber inside the first cap, second chamber inside the second cap, hollow fiber bundle with ends open in the first chamber and ends sealed to the second chamber by the second sealing body (at 21,31), a raw water supply port on casing (91), air discharge port (92), holes through the second sealing body (61), filtrate delivery port on the first cap (31), drain port on the second cap (21) as in claim 1. The covers can be opened and closed as in claim 6 (see fig – 2 and 3 - threaded). Filtration chamber is pressurization type as in claim 17 (see specification).

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2. Claims 1-5, 8 and 9 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by JP 11-319507.

JP 507 teaches a hollow fiber module comprising a cylindrical case (see figures), a first sealing body (3), a second sealing body (near 6), a first cap outside the first sealing body, a second cap outside the second sealing body, filtration chamber inside the case, first chamber inside the first cap, second chamber inside the second cap, hollow fiber bundle with both ends open in the first chamber and has U bend at the other end of the casing, a raw water supply port on casing (5), air discharge port (7), holes through the second sealing body (at 6), filtrate delivery port on the first cap (8), drain port on the second cap (at 6) as in claim 1. Cross-sectional area of the casing can be 150 cm² or more with packing ratio 40 to 70% as in claim 2 (see spec). Hollow fibers are kept apart from the casing wall by a spacer (4) which extend from the sealing body as in claim 3, and the protruding height is about 10 mm from the casing wall as in claim 4 (see spec), with faces of the spacers inclined towards the center of the cylindrical case as in claim 5. The case is made of thermoplastic, particularly PVC as in claims 8 and 9 (see spec).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 507.

JP teaches all the limitations of claim 1. Claim 7 adds further limitation of a check valve in the airline supplying to air to the module, which JP 507 does not teach. However, it would be obvious to one of ordinary skill in the art at the time of invention that check valves are commonly used in air supply lines to prevent backflow when the air-pressure goes down.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 507 in view of Bae (US 6,362,264 B1).

JP 507 teaches all the limitations of claim 9. Claim 10 adds further limitation of PVC having non-lead thermal stabilizer, which JP does not teach. Non-lead thermal stabilizers for PVC are taught by Bae 264 (abstract). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Bae in the teaching of JP 507 for the thermal stabilizer in PVC for drinking water or food application as taught by Bae (col 2 lines 46-60).

5. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 507 in view of Oshida et al (US 5,552,047) and Nomura et al (US 6,457,917 B1).

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JP 507 teaches all the limitations of claim 1. Claim 11 and 12 add limitations acrylonitrile – X-styrene co-polymer (claim 11) where X is a rubber such as ethylene-propylene (AES) or acrylic (AAS) (claim 12). Oshida teaches hollow fiber module housing having acrylonitrile – styrene copolymers (col 4 lines 3-8, lines 43-51) and Nomura teaches AES and AAS molding formulations (col 4 lines 13-25). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Oshida (047) and Nomura (917) in the teaching of JP-507 for the casing for dialysis type application as taught by Oshida (col 4 lines 3-8) because AAS and AES would give lightweight, high strength and stiffness for the housing (abstract – Nomura).

6. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 507 in view of Macheras et al (US 6,290,756 B1).

JP teaches all the limitations of claim 1 and the epoxy resin for the sealing body. Claims 13-16 add the type of epoxy used and the degree of penetration of the epoxy in the hollow fiber. JP-507 does not teach the details of the epoxy used. Macheras teaches Bisphenol A and F type epoxies for the sealing body in a hollow fiber module (col 5 lines 29-39). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Macheras in the teaching of JP 507 for an appropriate epoxy resin material for the sealing body. Re claim 16, JP 507 is silent on the degree of penetration of the epoxy into the hollow fibers. However, it would be obvious to one of ordinary skill in the art at the time of invention that the epoxy must penetrate sufficiently to provide the required seal with the sealing body for JP-507 to obtain sufficient sealing between the sealing body and the hollow fibers.

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7. Claims 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP-628 in view of Selbie et al (US 5,405,528).

JP 628 teaches all the limitations of claim 1. Claim 18-22 add further limitations, not taught by JP-628, but taught by Selbie, as follows: Identical modules are connected with each-other with discharge ports connected to a common pipe as claim 18, modules are mounted in plural rows in a frame in claim 19 which are symmetrically positioned in claim 20, supply water and filtrate ports are connected to common supply and filtrate pipes in claim 21 and the connections are by loose joints in claim 22. See Selbie (528), figures 5 and 6, and abstract. (The examiner is unclear what the 'loose joint' in claim 22 means, and considers this as 'joint that can be disconnected' for examination purpose). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Selbie in the teaching of JP-628 to string the modules in series/parallel for high capacity production.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 703-305-5999. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 703-308-0457. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.


Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

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Krishnan Menon
Patent Examiner
May 16, 2003


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